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TRANSL
22601

TT 76-53450

4101
From: Veterinariia (Kiev), Vol. 34, 1973, pp. 19-23.

2501
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2001
ON THE EPIZOOTIOLOGY OF FMD IN THE UKRAINE.
2021 Do pitannya epizootologii yashchurā v
ukrains'kii RSR).

Translated from Ukrainian

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FEB 10 1978

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Prepared for the Animal and Plant Health Inspection Service,
United State Department of Agriculture and National Science
Foundation, Washington, D.C. by Saad Publications
(Translations Division), Karachi, Pakistan.

ON THE EPIZOOTIOLOGY OF FMD IN THE UKRAINE.

VETERINARIIA (KIEV), in Ukrainian, Vol. 34, 1973, pp. 19-23.

(Article by Dubrovin, E.I. and V.I. Poluliakh).

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During the recent times, three foot and mouth epizootic occurrences were recorded in the Ukrain, which were caused by various types or varieties of the foot and mouth virus. The foot and mouth epizootic of the 1952 to 1955 was caused by the virus type A₇, the epizootic of the 1958 to 1963 was as a result of the virus type "O", and during the period of 1965 to 1966 it was caused by virus type A₂₂.

These three epizootics differed from each other by the development, duration, number of affected cattle, and the number of cattle which had succumbed to it.

If we take as 100 the number of areas and animals in the areas that were affected by the foot and mouth disease during the 1952 to 1955 epizootic, then the number of areas affected by this epizootic during the 1958-1963 was 52.5, the number of large cattle in these farms affected by the disease was 59, number of pigs was 240 and number of sheep was 972, whereas, during the

1965-1966 epizootic the reading was 58, 570, 612 and 445 respectively.

The available data illustrates that in the Ukrainian SSR, the foot and mouth epizootic type A_7 had affected animals for a period of 4 years, the recorded number of years for type "O" was 6 years, and that of type A_{22} was a little more than a year (15 months).

The percentage of cattle that had succumbed to foot-and-Mouth disease as compared to the number affected by the disease.

Year of epizootic	large cattle	pigs	Goats and sheep
1952-1955	0.7	5.4	1.0
1958-1963	1.7	11.6	4.5
1965-1966	0.2	1.8	0.5

The first two epizootics were active for a longer duration however, the number of the overall large cattle and pigs that were affected by the disease during these two epizootics were substantially less than during the 1965-1966 epizootic, which was caused by the A_{22} virus. During the last epizootic, the number of affected areas was almost twice as less as the epizootic caused by the virus type A_7 , the number of animal, however, which were affected by the disease was much more, namely: the

large cattle was 5.7 times more, the number of pigs was 6.1 times more and the number of goats and sheep was 4.4 times more.

The number of live-stock which had perished during these epizootics occurrences is shown in the Table.

The percentage of animals that had succumbed to the foot and mouth epizootic, caused by the A_{22} virus, as compared to the number that has suffered from the attack among the large cattle was 3.5 to 8.5, among the pigs it was 3 to 6 and in case of goats and sheep 2 to 9 times less than during the previous two epizootics.

The foot and mouth epizootic, caused by A_{22} virus, was benign and manifested itself in a normal clinical form.

However, in some cases, the cows that had been affected by the foot and mouth disease, 3 to 6 months later, had developed some complications, which were in the nature of disorder of the cardiovascular and respiratory systems, loss of weight, decreased milk production, and delay in molting of cows. Our observations of some farms have indicated that 30 such cows continued to show the above signs of complications even 3 to 4 years later.

During this period, the milk production of all cows, of varying ages, under observation, decreased, on the average by 34%.

Large cattle affected by the foot and mouth disease was 51%, the number of pigs was 50%, and the overall number of goats and 3

large cattle was 2.7 times more, the number of pigs was 6.7 times more and the number of goats and sheep was 4.5 times more.

The number of live-stock which had perished during these

epidemics is shown in the Table.

The percentage of animals that had succumbed to the foot and mouth epidemic, caused by the A₂₅ virus, as compared to the number that had perished from the attack among the large cattle

was 5.2 to 6.2, among the pigs 15 to 20 and in case of goats and sheep 5 to 9 times less than during the previous two

epidemics.

The foot and mouth epidemic, caused by A₂₅ virus, was benign and manifested itself in a normal clinical form.

However, in some cases, the cases that had been affected by the foot and mouth disease, 3 to 6 months later, had developed some complications, which were in the nature of disorder of the cardiovascular and respiratory systems, loss of weight, decreased milk production, and delay in milking of cows. Our observations of some farms have indicated that 30 such cases occurred in some of the above signs of complications even 3 to 4 years later.

During this period, the milk production of all cows, of varying ages, under observation, decreased, on the average by 50%.

A positive role, in decreasing the loss of animal's life as a result of foot and mouth infection, was played by using (specially in case of the younger stock) hyperimmunizing serum and blood serum of animals which have had foot and mouth disease, as prophylactic and medicinal measures.

In order to understand the foot and mouth epizootic, we must record some peculiarities in the development and the course of the foot and mouth epizootic, caused by the A₂₂ virus in the Ukrainian SSR.

In our country, the foot and mouth disease, caused by the A₂₂ virus, was first observed in 1965.

In our efforts to analyse the source and means of bringing in the foot and mouth infection and its propagation at the commencement of the foot and mouth disease, we have also studied the various meteorological conditions and its influence on the disease.

The dynamical development of the foot and mouth epizootic, caused by A₂₂ virus, shows that this disease was propagated in Ukraine in Autumn and Winter. The sixty three percent of all areas, affected by the foot and mouth disease, was from the month of October to December, 1965. During this period, the number of large cattle affected by the foot and mouth disease was 61%, the number of pigs was 50%, and the overall number of goats and

sheep was 46.6% during the whole of the period of the foot and mouth epizootic of 1965-1966.

Such rapid propagation of the foot and mouth infection is explained, apparently, not only by the properties of the foot and mouth A₂₂ virus, which appeared in our country for the first time, but also by the high susceptibility of animals, to this virus. The total increase in the overall number of the large cattle and pigs during the period from 1952 to 1965 being 1.8 to 2 fold in the Ukrainian SSR, the overall animals which were infected by the foot and mouth disease per one area affected by the 1965 - 1966 epizootic, at an average, increased by 9 to 10 times as compared with the previous epizootic.

The propagation of the foot and mouth epizootic, during the autumn-winter periods, was observed to be much less among the privately owned animals.

During the highest peak of the epizootic almost all the large cattle in the affected kolkhozes and Sovkhozes went down with the foot and mouth infection.

The percentage of affected animals was many times higher in the areas of the Republic where the foot and mouth epizootic, caused by the A₂₂ virus, was observed in October-December, 1965, than in the areas where the epizootic appeared in 1966.

The reason for a smaller overall morbidity of the foot and mouth disease in these areas is the highly effective anti-foot

and mouth measures which were applied in 1966, specially, the large volume of prophylactic vaccination of animals against the disease.

During the spring and summer of 1966, we were afforded the required conditions, for carrying out, more effectively, the prophylactic measures and other measures to put an end to the foot and mouth epizootic, namely: distribution of live-stock in farms (transfer of animals to summer enclosures and pastures); more effective disinfection of the barns in farms and summer enclosures; better adherence to the storage requirements of purulent substance and its biothermal disinfection to remove the foot and mouth virus, stricter maintenance of the quarantine measures, which also include a quarantine (according to the location of the animals) for the cattle-breeders.

These factors, along with the prophylactic vaccination of animals against the foot and mouth virus, discussed above, were of a great value in the effort to prevent the further spread and development of the foot and mouth epizootic.

For the anti-foot and mouth vaccination, aluminum hydroxide fromol vaccine from the lapinized A_{22} virus was utilized.

In 1966, 27122 thousand of large cattle, 192 thousand of pigs and more than 600 thousand heads of sheep and goats were vaccinated in the Ukrainian SSR.

On an average, two anti-foot and mouth vaccinations were carried out per head of the large cattle, which were not attacked by the foot and mouth disease. These measures have ensured a large section of animals which were not susceptible to foot and mouth infection, which was an important condition for the action against further spread of the foot and mouth infection in the Republic and elimination of the epizootic.

The study of the development and passage of the foot and mouth epizootic in the Ukrainian SSR from 1965 to 1968, which was caused by the A₂₂ virus, makes it possible to make the following conclusions:

1. Right from the beginning, epizootic had a quick start and in a short period of time (only 10 days) it gripped a large number of areas and a substantial number of live-stock. During this period (October-December, 1965) there was 63% of the total areas affected by the foot and mouth infection for the whole period of the epizootic 61% of the infected live-stock of large cattle, 50% of pigs and 46.6% of sheep and goats infected with the foot and mouth virus.

2. Maximum development of the epizootic was observed during the indoor maintenance of the live-stock (October 1965 to March, 1966). The period recorded 94% of all the areas that were affected, which included 93.8% of all large live-stock cattle that had been infected by the foot and mouth virus during whole period of the epizootic.

3. Second month of the epizootic, i.e. November, recorded the largest number of discovered areas infected with the foot and mouth virus (35% of all the areas during the epizootic), whereas, the third month, namely, December, recorded the greatest number of animals which had been attacked by the foot and mouth disease (39.2% of the total number of the infected large cattle, 31.4% of pigs, 41.4% of sheep and goats).

4. The regions of the Republic where the foot and mouth epizootic made its appearance from October to December, 1965, the number of animals which were attacked by the foot and mouth virus was from 3 to 30 times greater than in areas where the epizootic made its appearance in 1966.

5. The quick spread of the epizootic, in its initial period, was helped by the appearance of the new foot and mouth epizootic caused by A₂₂ virus, which so far, was not registered in our country and therefore, susceptibility of our animals to it was quite apparent; prevailing (October-December) low (minus) temperature of the air and soil, created favorable conditions for the preservation of the foot and mouth virus and its accumulation (as a result of not very effective disinfection during the winter period) in large quantities in the surrounding atmosphere; closely packed animals in the farms, kolkhoses and sovkhoses as a result of the indoor maintenance of animals, regrouping of animals for the winter months, as well as, the lively activity in the farms

caused by the dispatch of the farm products (October-December), and the possible influence of the meteorological conditions on the infection and further spread of the foot and mouth virus. From October to December, 1965, we had recorded 40 to 70% of all the winds, which came from the direction of the initial foot and mouth infected areas and a substantial number of rain and snow during this period (10 to 24 days) with a total monthly snow and rainfall of 15 to 132 mm.

6. Aluminum hydroxide formol vaccine, from the lapinized A₂₂ virus, used for the vaccination of the farm animals, from the month of March to December, 1966 in the areas and zones which were free of the foot and mouth infection, helped to successfully eliminate the foot and mouth epizootic.

7. During a benign form of the foot and mouth epizootic, some of the live-stock cows, which had contracted this disease, after 3 to 6 months period, have manifested certain complications, which included the cardiovascular and respiratory disorders, loss of weight, decreased production of milk and delayed molting. Our observations (3 to 4 years) have shown that these disorders may be retained by the cows for a long period of time.

